Companion Modeling to Enhance Spring Water Collection and Sharing in East Bhutan

Resource management context

Figure 1. Traditional water collection system still being used in Kengkhar.

- One of the remote & water scarce settlement in the country.
- Dwindling spring ponds are the only source of drinking.
- Tremendous pressure on scarce water resource due to increased demand (human, livestock, gardens).
- Attempts to bring piped water from 15km did not provide a stable solution.
- Appropriate water collection & sharing mechanisms can be out-scaled to other areas in Bhutan.

Socio-ecological setting

- 380 households practice upland farming & cattle rearing in 156 km^2 with elevation of 860-2400m & annual rainfall of 1000 mm.
- From 20 springs only 6 ponds exist.
- As spring dries people have to share dwindling resource.

Figure 2. Landscape & people of Kengkhar in Mongar District.

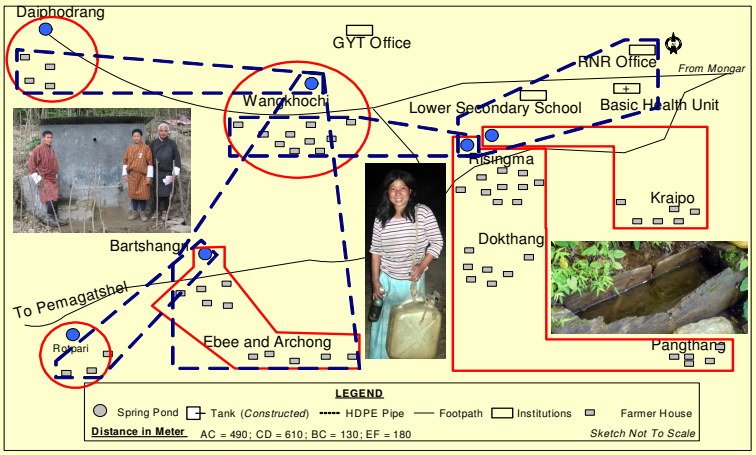

Figure 3. Distribution of spring ponds in Kengkhar.

Research objectives

- Enhance the stakeholders' understanding & resiliency of spring ponds managed as network.
- Facilitate mobilization of community in collective management of water resource in the village.

Phases of ComMod process

- The process started with repetitive consultation with water users & institutions in the study area.
- Developing a sharing mechanism: research team in consultation with the community built a network of 7 concrete water tanks.

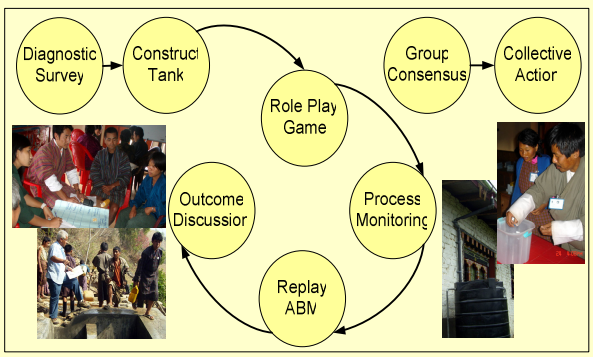

Figure 4. ComMod process in Kengkhar.

Gaming & simulation sessions

- The Role Playing Game (RPG) using the tank network helped to create awareness in management options.
- Computerized RPG helped players to display their actions in the gaming sessions & explain the concept to other non-participant households.

Figure 5. Phases of gaming sessions (Briefing, playing, computing, player interview & result discussion).

Monitoring & evaluation

Constant monitoring by local facilitator cum extension officer at the site who reported to researchers & irrigation engineer.

Computer model & Replay of gaming sessions

- An agent-based simulator replaying gaming sessions was developed.
- Players easily grasped the concept & could represent their move & explain their choices.

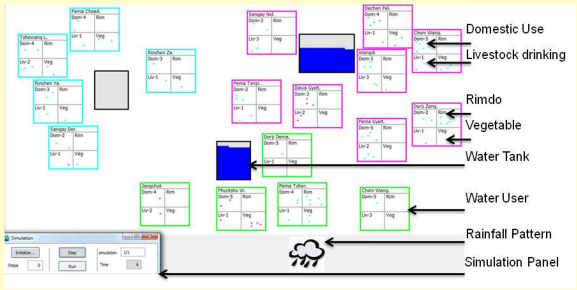

Figure 6. Interface of agent-based simulator.

Influence of communication & new knowledge

Communication facilitated by gaming tools enhanced water sharing & saving mechanism & helped communit to better understand the benefit of water sharing & conservation.

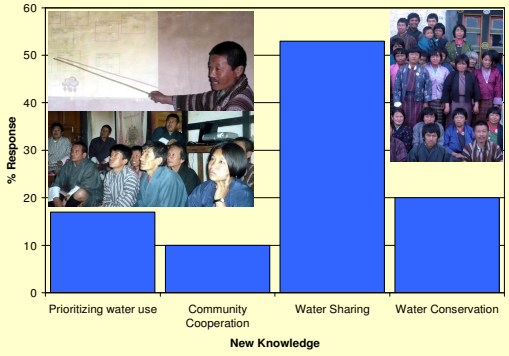

Figure 7. New knowledge gained.

Collective action plan

- Identification of spring catchments & protection measures;
- Maintaining sanitation of the water tanks & network pipe.

References

Domang, C. Nima, Y. Lhamo, R. Choni, T.R. Gurung, 2007. Water Resource a Development priority in Kengkhar, Mongar, RNR-RC Wengkhar, Bhutan

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Authors & institutions

Gurung, T.R[1]., Le Page, C[4]., Nima, C[1]., Choney, R[2]., Landy, F[3]., & Trébuil, G[4]. (1) RNR Research Centre, Ministry of Agriculture, Wengkhar, Bhutan; (2) RNR Extension Centre, Kengkhar, Bhutan; (3) Paris Ouest Nanterre La Défense University, France; (4) GREEN (Management of renewable resources & environment) research unit, CIRAD, France.